Software Engineering Reviews and Audits

Overview

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Software Engineering Reviews and Audits

- **Currently working Software Engineering (Quality) - The Boeing Company in Seattle, Washington.**
- **Program(s):** Missile Systems, B2 Bomber, Advanced Satellite Systems, F-22 Raptor Air Vehicle Systems, 737 Airborne Early Warning and Control (AEW&C) Australia and South Korea programs.
- CMMI v1.3 Model Upgrade Certification

Software Engineering Reviews and Audits

?

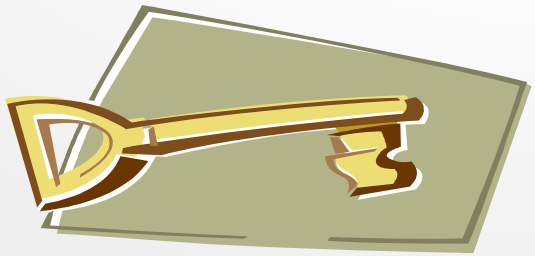
How can internal organizations ensure software engineering programs or projects become successful?

Software Engineering Reviews and Audits

This presentation will not answer every **Question** about the importance of **Reviews** and **Audits**, but provide ideas and solutions to consider.

Software Engineering Reviews and Audits

The emphasis of software disciplines are "**key"** to ensure effective methods are in place for reviews and audit performance.

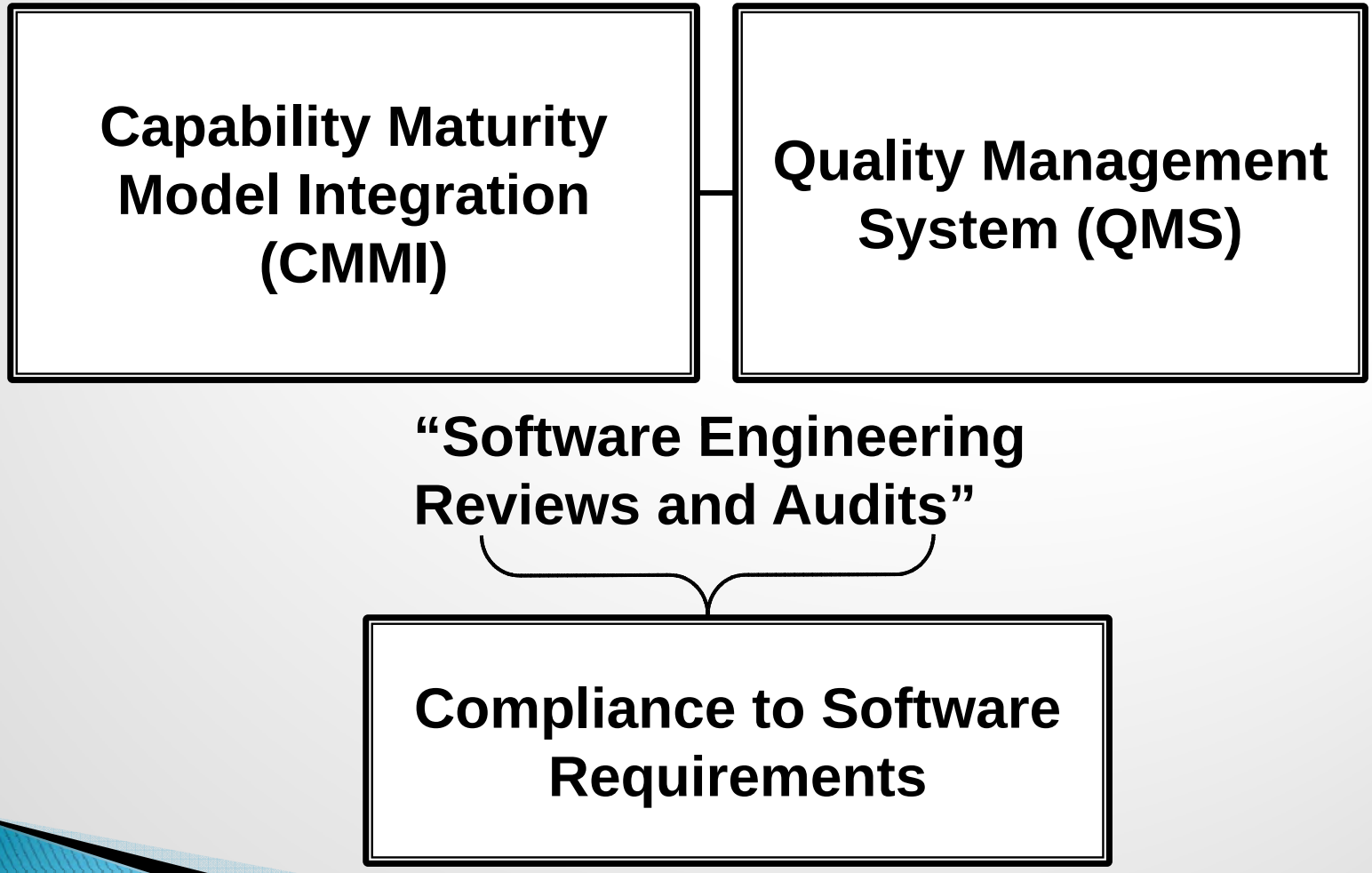


Software Engineering Reviews and Audits

Defined software plans consist of:

- **systems and software development**
- **configuration management**
- **test, integration, and delivery**
- **software quality evaluations**

Software Engineering Reviews and Audits



Software Engineering Reviews and Audits

Software Engineering Reviews and Audits

provide a readiness for conducting and performing:

- First Article Inspection (FAI)
- Functional Configuration Audits (FCA)
- Physical Configuration Audit (PCA)

Software Engineering Reviews and Audits

Reviews and Audits prepare us to answer questions:

- what are the requirements?
- who needs to participate?
- how do we ensure released baselines are compliant and meet quality objectives?

Software Engineering Reviews and Audits

Accurate reviews and audits are essential to the software industry military and aerospace programs to define the framework and specific requirements for "**verification** and **validation"** of software development efforts.

Software Engineering Reviews and Audits

“ software development and the disciplines required is a dream - software engineering reviews and audits are serious.”

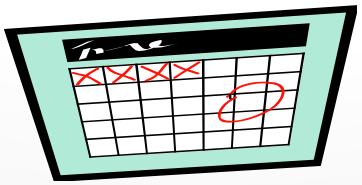
Boyd L. Summers

Software Engineering Reviews and Audits

Senior Management must have in place**:**

- **allocated budget**

- **committed schedules**



- **trained personnel**

Software Engineering Reviews and Audits

Senior Management will always provide  when they see:

- effective software development
- team work performance
- customer expectations achievement
- quality improvement

Software Engineering Reviews and Audits

“why do our software programs or projects need to worry or be concerned?”

Software Engineering Reviews and Audits

answer:

“assurance that software products delivered to customers have been reviewed, audited, verified, and meet required quality requirements.”

Capability Maturity Model Integration (CMMI)

Improving processes for developing better products and services

by adopting **CMMI practices**, I have seen for years software development processes improve.

Software Engineering Reviews and Audits

effective software development plans and processes are better defined for:

- **planning**
- **design**
- **test**
- **integration**

Software Engineering Reviews and Audits

software plans, documented processes and procedures, artifacts, data packages are requirements when it is time to conduct and perform **software engineering reviews and audits.**

Software Engineering Reviews and Audits

The scope is to review and confirm information is complete, correct, and configuration changes are sufficiently addressed.

Software Engineering Reviews and Audits

The **CMMI** model provides effective methods for systems and software engineering and integration environments.

Let's discuss "**Peer Reviews"**

Software Engineering Reviews and Audits

Definition:

The **Peer Review** is the review of software work products developed by other software designers during development of those work products to identify and fix defects.

Software Engineering Reviews and Audits

CMMI for Development v1.3

Process Area:

Verification

"**peer reviews** are an important part of ***verification*** and are a proven mechanism for effective defect removal."

Software Engineering Reviews and Audits

Examples of peer review methods include the following:

- Inspections
- Structured walkthroughs
- Deliberate refactoring
- Pair programming

Software Engineering Reviews and Audits

Software and System Integration

The **quality** enforcer will ensure that the processes such as **peer reviews**, are followed.

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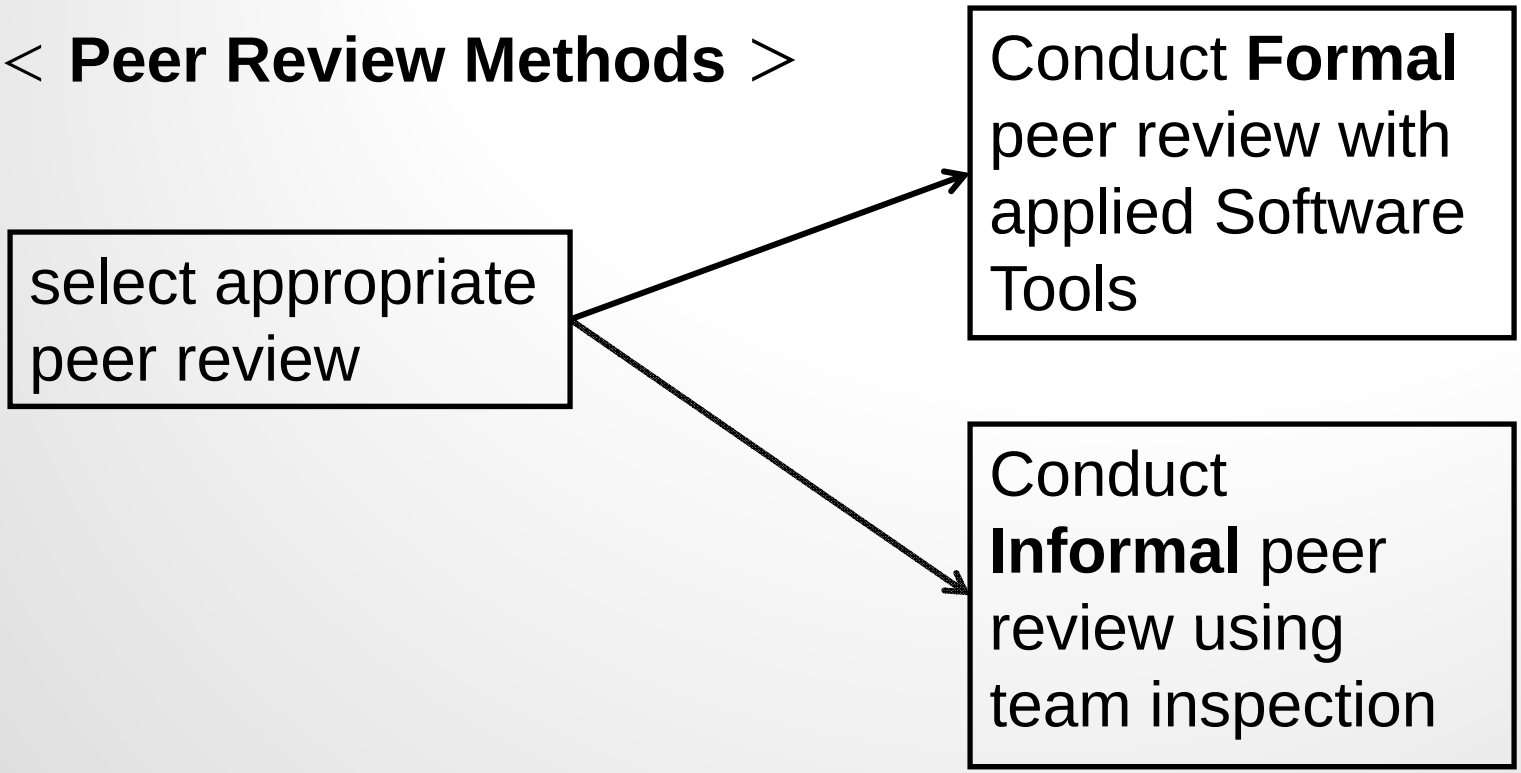
< **Peer Review Methods** >



Software Engineering Reviews and Audits

To ensure you have a successful peer review, select trained reviewers and guidelines are understood from the **start**.

"If the peer review was conducted and performed correctly, you have done it right."

Software Engineering Reviews and Audits

Quality Management System (QMS)

Standards AS9100, SAE AS9110, and ISO 9001

Quality Systems is the **model**:

- quality requirements,
- design and development
- production
- installation
- service.

Software Engineering Reviews and Audits

QMS is simply:

- defined and documented software processes
- execution of processes
- monitoring or measuring processes
- making continual improvements

Software Engineering Reviews and Audits

- **Plan** – Processes are documented to deliver results
- **Do** – Implementation is accomplished by a skilled work force.
- **Check** – Compliance to improve performance.
- **Act** – Take actions to continually improve performance.

Software Engineering Reviews and Audits

In order to have quality management implemented be :

- focused
- process based
- improvement oriented

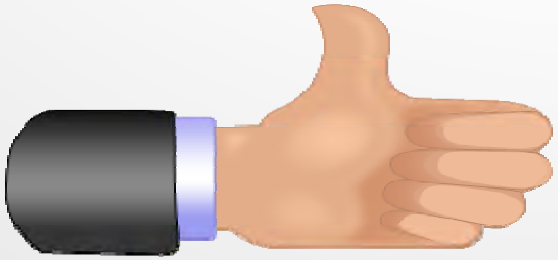
“say what you do, do what you say, prove it, and improve it”

Closing Statement:

Software Engineering Reviews and Audits

Software Engineering Reviews and Audits

"improve individual and team efforts in maintaining a professional setting where software is developed for **profit, cost reduction**, and **service quality improvement."**



Software Engineering Reviews and Audits

AEW&C	Airborne Early Warning & Control
AS	Aerospace
CMMI	Capability Maturity Model Integration
FAI	First Article Inspection
FCA	Functional Configuration Audit
ISO	International Organization for Standardization
PCA	Physical Configuration Audit
QMS	Quality Management System